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S/N: 10/707,170

In the Claims

What is claimed is:

1. (Original) A method of MR imaging comprising:  
acquiring k-space data for less than all of k-space from a subject;  
reconstructing the k-space data into image data having a first resolution;  
transforming the image data into k-space data; and  
processing the transformed k-space data into image data having a second resolution, the first resolution being different from the second resolution.
2. (Original) The method of claim 1 wherein the step of transforming includes applying one of a Fast Fourier Transform (FFT) and a Radon transformation to the image data.
3. (Original) The method of claim 1 wherein the step of processing includes applying a partial Fourier transformation to the transformed k-space data.
4. (Original) The method of claim 3 wherein the partial Fourier transformation includes one of homodyne processing and POCS processing the transformed k-space data.
5. (Original) The method of claim 1 wherein the second resolution exceeds the first resolution.
6. (Original) The method of claim 1 further comprising the step of acquiring the k-space data from a subject being translated through an imaging volume.
7. (Original) The method of claim 1 wherein the step of reconstructing includes the step of replacing unacquired portions of k-space with zero-value data.
8. (Original) The method of claim 1 wherein the step of reconstructing includes the step of carrying out a moving table reconstruction of the k-space data.
9. (Original) The method of claim 1 wherein the step of reconstructing includes correcting for gradient non-uniformities.

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10. (Original) The method of claim 9 configured to utilize Hermitian symmetry after the k-space is acquired and corrected.

11. (Original) The method of claim 9 configured to utilize Hermitian symmetry to improve resolution of an image generated from a less than all k-space data acquisition.

12. (Currently Amended) An MRI apparatus comprising:

a magnetic resonance imaging (MRI) system having a plurality of gradient coils positioned about a bore of a magnet to impress a polarizing magnetic field and an RF transceiver system and an RF switch controlled by a pulse module to transmit RF signals to an RF coil assembly to acquire MR images;

a table configured to translate a patient through an imaging volume during data acquisition; and

a computer programmed to execute an image generation technique that utilizes Hermitian symmetry in the reconstruction of an image from MR data after the MR data has been corrected for ~~non-uniformities~~ moving table induced errors.

13. (Canceled)

14. (Currently Amended) The MRI apparatus of claim ~~13~~ 12 wherein the table is further configured to continuously translate the patient through the imaging volume during data acquisition.

15. (Original) The MRI apparatus of claim 12 wherein the image generation technique causes the computer to:

acquire MR data of a patient;

correct geometric distortions in the MR data;

reconstruct the MR data to image data;

transform the image data back to k-space data; and

process the k-space data to generate image data with enhanced resolution.

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16. (Original) The MRI apparatus of claim 15 wherein the computer is programmed to transform the image data by applying one of an FFT and a Radon reconstruction to the image data.

17. (Original) The MRI apparatus of claim 15 wherein the computer is programmed to process the k-space data by applying a partial Fourier reconstruction to the k-space data.

18. (Original) The MRI apparatus of claim 17 wherein the partial Fourier reconstruction includes homodyne reconstruction of the k-space data.

19. (Original) A computer readable storage medium having stored thereon a computer program representing a set of instructions that when executed by a computer causes the computer to:

transform a first image space dataset into a k-space dataset;

partial Fourier reconstruct the k-space dataset into a second image space dataset;

and

generate an image from the second image space dataset.

20. (Original) The computer readable storage medium of claim 19 wherein the set of instructions further causes the computer to acquire an MR dataset from a moving object and reconstruct the MR dataset into the first image space dataset.

21. (Original) The computer readable storage medium of claim 20 wherein the set of instructions further causes the computer to correct gradient non-uniformities in the acquired MR dataset.

22. (Original) The computer readable storage medium of claim 21 wherein the set of instructions further causes the computer to zero-pad the MR dataset to have a desired dimension.

23. (Original) The computer readable storage medium of claim 19 wherein the set of instructions further causes the computer to transform the first image space dataset with an FFT.

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24. (Original) The computer readable storage medium of claim 19 wherein the image has a resolution that would exceed that of an image generated from the first image-space dataset.

25. (Original) The computer readable storage medium of claim 19 wherein the set of instructions further causes the computer to apply one of a homodyne reconstruction and a POCS reconstruction to partial Fourier reconstruct the k-space dataset.

26. (New) The MRI apparatus of claim 12 wherein the moving table induced errors include moving table induced phase error resulting from at least one of geometric distortions, changes in table position, and gradient non-uniformity.

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